

REMARKS

In the outstanding Office Action, the Examiner: rejected claims 1, 3, 5, and 6 under 35 U.S.C. § 102(e) as being anticipated by Li et al. (U.S. Patent No. 6,284,149); and rejected claims 2 and 4 under 35 U.S.C. § 103(a) as being unpatentable over Li et al. in view of Koshimizu (U.S. Patent No. 5,997,687).

Claims 7-40 are pending in this application, with claims 7, 10, 15, 18, 21, 26, 29, 32, 35, and 38 being independent claims. Claims 1-6 have been canceled. Claims 7-40 are newly added to more clearly define features of the present invention. No new matter has been entered.

Applicant respectfully requests reconsideration and withdrawal of the rejections set forth in the above-identified Office Action.

REJECTIONS UNDER 35 U.S.C. § 102(e)

Claims 1, 3, 5, and 6 are rejected under 35 U.S.C. § 102(e) as being anticipated by Li et al. (U.S. Patent No. 6,284,149), according to the rationale discussed on pages 2-3 of the Office Action. While the Examiner's rejection is rendered moot by the cancellation of claims 1-6, Applicant respectfully traverses the Examiner's reasons for this rejection.

Li et al. discloses a plasma etching process for etching a carbon-based low-k dielectric layer in a multi-layer inter-level dielectric. Li et al. discloses a two-step process for a via etch, where the first step is to etch both the oxide upper stop layer (18) and at least the upper divinyl siloxane-benzocyclobutene (BCB) layer (20), and the second step etches only the remaining BCB or a small amount of photoresist (See Fig. 17 of Li et al.). As will be described below, Li et al. does not teach or suggest the

claimed invention because it fails to disclose each and every element of the claimed invention.

Each of claims 7, 18, and 21 recites a combination of features including, among other things, utilization of the same type of processing gas both before and after switching or stopping power level. Li et al., however, discloses the first step and the second step each utilizing different types of processing gases, as shown, for example, in lines 23-27 of column 18, line 64 of col. 18 - line 20 of col. 19, and Table 6. At least for this reason, each of claims 1, 18, and 21 is not anticipated by Li et al.

Each of claims 10 and 21 is drawn to a plasma processing method for removing a photoresist film formed at a workpiece having a fence portion placed within a processing chamber. Li et al., however, does not disclose, among other things, a step of removing a photoresist film formed at a workpiece having a fence portion. In fact, Li et al. does not even recognize the fact that a workpiece has a fence portion. At least for this reason, each of claims 10 and 21 is not anticipated by Li et al.

Each of claims 15 and 26 recites a combination of features including, among other things, etching a workpiece and applying high-frequency power for biasing to the workpiece and removing a fence portion formed during etching. For the similar reason set forth above, Li et al. fails to disclose a step of removing a fence portion. At least for this reason, each of claims 15 and 26 is not anticipated by Li et al.

Each of claims 29 and 32 recites a combination of features including, among other things, etching a film by utilizing a resist film as a mask, and ashing the film with a first biasing power level substantially halfway through the resist film after etching, and ashing with or applying a second biasing power level after ashing with the first biasing

power level. Li et al. teaches away from the claimed invention since it fails to disclose, among other things, ashing the film with a first biasing power level substantially halfway through the resist film after etching. While it is unclear whether the first step of Li et al. involves an ashing process at all, Li et al. specifically discloses in col. 17, lines 34-45, that the first step in a two-step process etches both the oxide upper stop layer (18) and at least the upper BCB layer (20), and a second step is performed after punching through the upper stop layer (18) and before or immediately after clearing the photoresist. That is, in a single step with a bias power, the photoresist is almost, if not completely, cleared. This is further supported by col. 18, lines 19-20 and line 64-65, which state that "the first step is designed to retain the photoresist as long as possible even at a loss of BCB etch rate" and "the second step etches only the remaining BCB or a small amount of photoresist," respectively. Therefore, there can be no teaching or suggestion in Li et al. for ashing the film substantially halfway through the resist film with a first biasing power level and then ashing with or applying a second biasing power level. At least for these reasons, each of claims 29 and 32 is not anticipated by Li et al.

Each of claims 35 and 38 recites a combination of features including, among other things, removing a photoresist film used as a mask to etch a specific layer of a workpiece to a middle portion thereof. Li et al. does not teach or suggest the claimed invention because it fails to disclose, among other things, a photoresist film used as a mask to etch a specific layer of a workpiece to a middle portion thereof. Instead, Li et al. utilizes BCB dielectric layers (16, 20) that surround a stop layer (18). At least for these reasons, each of claims 35 and 38 is not anticipated by Li et al.

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At least for the reasons set forth above, each of the claims is not anticipated by Li et al. Thus, reconsideration and withdrawal of these rejections is respectfully requested.

REJECTIONS UNDER 35 U.S.C. § 103(a)

Claims 2 and 4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Li et al. in view of Koshimizu (U.S. Patent No. 5,997,687), according to the rationale discussed on pages 3-5 of the Office Action. The Examiner's rejection is rendered moot by the cancellation of claims 1-6.

As discussed above, Li et al. fails to teach or suggest each and every element of the claimed invention. Applicant respectfully submits that Koshimizu fails to supplement the deficiencies of Li et al. At least for this reason, the claimed invention is not rendered obvious over the cited prior art. Thus, reconsideration and withdrawal of this rejection is respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of all pending claims 7-40.

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Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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